2005 Annual Report

of the
Delaware Nutrient
Management Commission

to Governor Ruth Ann Minner and the
143rd Delaware General Assembly

April 1, 2006

Delaware DEPARTMENT of AGRICULTURE
Serving Agriculture and Protecting Consumers

"Farming for cleaner water"

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Introduction

This report includes information about the Delaware Nutrient Management Commission's activities in 2005 and reviews ongoing efforts to improve water quality. The 1999 Nutrient Management Law (3 Del. C. §2200 et al.) requires the Commission to annually report on nutrient management training activities, best management practices implemented, the number of acres under nutrient management plans and critical areas that will be targeted for action.

The Commission continues to make progress towards achieving established goals as this report represents progress for 2005. Priorities for implementing program goals include:

1. Provide continued educational opportunities for certification of nutrient handlers;
2. Provide optimal resources for nutrient planning, record keeping and other proven Best Management Practices (BMPs) relating to nutrients and water quality;
3. Promote and continue support of exporting excess poultry litter to farms or alternative use projects in need of nutrients;
4. Implementation of a concentrated animal feeding operation permitting program.

The Commission is continuing its efforts to improve the quality of Delaware's waters while preserving the state's valuable agricultural industries. It has met, and is on track, to meet the nutrient management deadlines established by 1999 legislation. January 2006 marked the fourth of five legal deadlines that will affect all Delaware farmers, golf courses and other nutrient handlers. All nutrient handlers had a certification deadline of January 2003; resulting in 2,170 certifications. The law also requires 20% increments for implementing mandatory nutrient management standards starting 2003. The remaining mandates continue to be phased in every January until we reach the full-implementation deadline of 2007. To date, 85% of Delaware cropland is enrolled or mandated into program requirements, 5% ahead of the deadline.

The following sections fulfill the reporting requirements to the Governor and the General Assembly as stated in the Nutrient Management Law. Additional information is included that represents measurable results and accountability for nutrient handlers. They include updates about topics such as research and demonstration, permits for certain farms, poultry company agreement, phosphorus management, program budget, internal audits, environmental stewardship and complaint resolutions.

This year's Ag Week was held in Harrington and provided farmers and nutrient handlers opportunity to acquire continuing education credits.

Nutrient Management Training, Education and Certification

The Commission continues to view education as a priority for many nutrient management topics. As farmers and other nutrient handlers become more aware and educated on topics, they will demonstrate more accountability. The Commission has issued 2,170 certifications as outlined and can be individually viewed on the Program's website. (See contact information on Page 16.)

1. 638 Nutrient Generator certifications valid for three years;
2. 1,403 Private Nutrient Handler certifications valid for three years;
3. 48 Commercial Nutrient Handler certifications valid for one year;
4. 81 Nutrient Consultant certifications valid for one year.

The Commission continues to offer and coordinate certification classes, as required by law, for all levels of certification. The University of Delaware Cooperative Extension conducts most of these classes. Classes are offered for fulfilling the initial certification and continuing education requirements. The Law (3 Del. C. §2201 et al.) required that all nutrient handlers be certified by January 2003.

In order to become certified as a consultant or a commercial nutrient handler, one must pass an examination. Three examination sessions for nutrient consultants and five examinations for commercial nutrient handlers were offered in 2005, resulting in 21 (72%) passing scores and 8 (28%) failing scores. Nutrient consultant test questions are pulled from a databank of questions shared by Delaware, Maryland, Virginia and Pennsylvania for reciprocal purposes. The examinations for commercial nutrient handlers were generated by the University and Program Staff.

All certifications, except Nutrient Consultants, are issued over a three year period. Nearly one third of the expirations will occur May 1, 2006. During 2005, 33 continuing education classes were offered at 17 different locations. These classes were organized by the following associations:

1. University Cooperative Extension: 27 meetings with 1,413 individuals receiving credit;
2. Private agri-service companies: 3 meetings with 6 individuals receiving credit;
3. Others: 3 meetings with 38 individuals receiving credit.

Continuing education opportunities can be integrated with any meeting or gathering of nutrient handlers. One continuing education credit is equivalent to approximately 50 minutes and will be prorated in one-quarter credit increments. Credits are approved by providing the meeting or class agenda to the University of Delaware Research and Education Center or the State Nutrient Management Program prior to the event.

Nutrient Management Research and Demonstration

Research and demonstration projects are important in the effort to couple science with policy development. In many situations, the ideal scientific solution is not the more practical solutions in the field. Demonstration projects validate proven science in farm fields owned by Delaware farmers and provide balanced feedback for policy implementation.

Sixteen demonstration projects were implemented throughout the state for the purpose of improving current nutrient management best management practices during crop production. These projects were conducted by the University of Delaware Cooperative Extension and were located on eleven Delaware farms. The projects included:

1. Improving N management of corn;
2. Impact of poultry litter applications on corn yield and soil test levels;
3. Phosphorus fertilization of corn;
4. Using diagnostic tools to prevent over application of nitrogen fertilizer;
5. Value of slow-release N fertilizers for corn and winter wheat;
6. Nutrient removal rates by Delaware Crop;
7. Remote sensing as a tool for improving nutrient management.

Research projects were initiated in 2005 in response to the Commission's request for research and demonstration funding. $160,000 was appropriated (one-time) with the General Assembly's intent that projects will be a collaborative effort of the Commission, Department of Agriculture and the Legislative Council Technical Advisory Office. A Commission grant program was established and a committee reviewed ten proposals. The committee obligated $152,924 for the implementation of five projects that met the research priorities of the Commission. The five projects follow:

1. *Poultry Litter Revitalization: A Nutrient Management Opportunity*, University of Delaware. $20,000 will evaluate litter revitalization strategies that will extend litter life, eliminate or reduce the need to remove and store caked litter, and reduce ammonia losses to the environment.

2. *Managing Temporary Storage of Poultry Litter in Delaware*, University of Delaware. $35,789 will examine production size poultry litter piles and associated best management practice for minimizing nutrient losses during temporary outdoor storage. The projects will evaluate the storage duration, cover types and alternative pile bases in areas of temporary storage.

3. *Effective Setbacks for Controlling Nutrient Runoff Losses from Land-applied Poultry Litter*, Delaware State University. $45,265 will be dedicated to measuring the effectiveness of poultry litter application setbacks. A 100-foot setback, winter cover crop and litter/soil incorporation practices will be evaluated for nutrient runoff.

4. *Advancing Nutrient Management In Delaware: Accurate Nutrient Budgets and Prioritized Best Management Practices*, University of Delaware. $28,122 will fund an accurate, up-to-date nutrient balance for the state which will account for practices such as Phytase use in poultry feed, the Perdue AgriRecycle plant, the Nutrient Relocation Program and more. Additionally, a farm-scale nutrient balance software program will be developed along with a systematic best management practice rating scale for measuring the effectiveness in nutrient reduction.

5. *Utilization of Poultry Litter as Activated Carbon Sources*, Delaware State University. $23,748 will be used to explore optimal carbonization and activation conditions for converting Delaware source poultry litter to activated carbon. Activated carbon is a common and powerful adsorbent used to filter impurities from liquid and gas waste streams. This project is an exploration for further alternative uses.

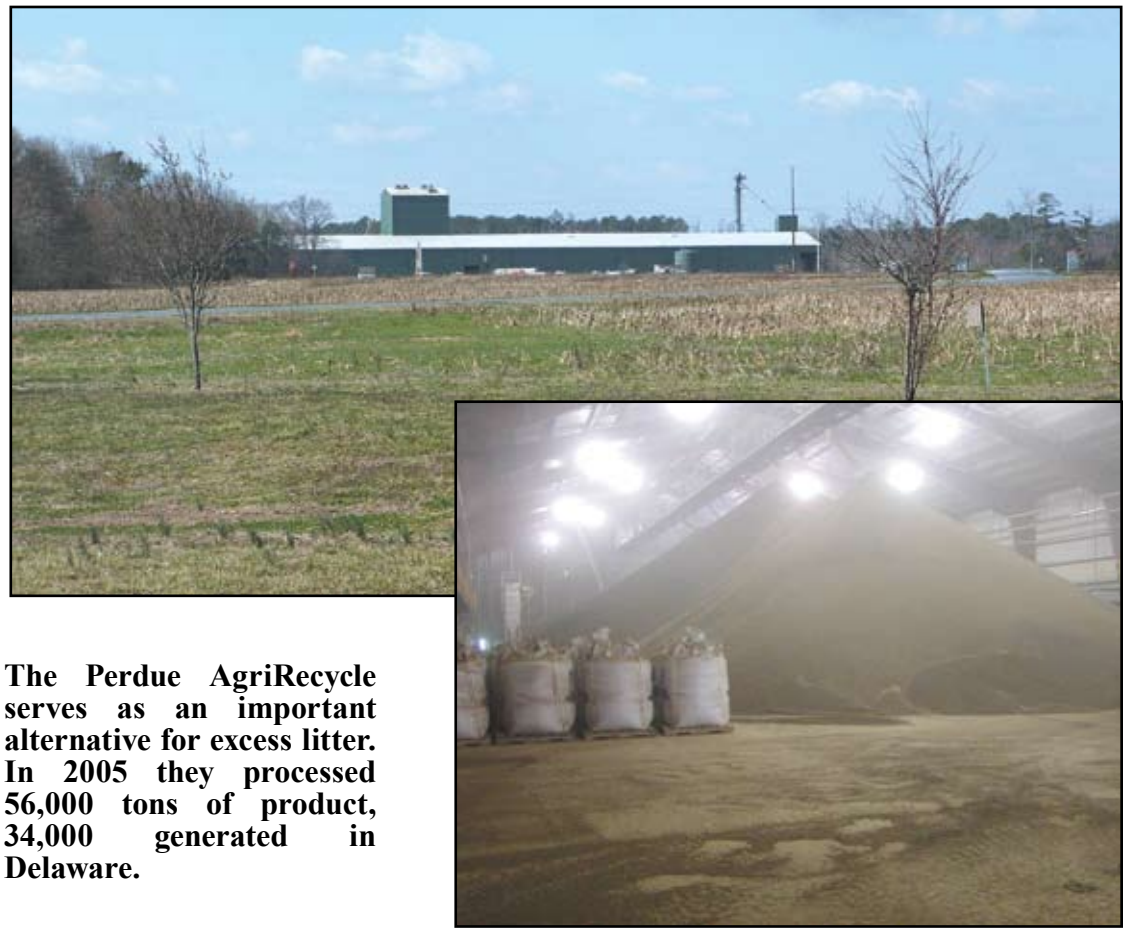
Proper handling and storage of poultry litter continues to be a priority for Research and Demonstration.

Nutrient Management Relocation

Many farmers are dealing with excess manure, namely poultry litter, and need to export the manure in order to balance crop nutrient demands. The Relocation Program is a partial solution to the excess litter generated in Delaware. Funds are available for farmers, brokers or trucking businesses to relocate excess poultry litter.

The Relocation Program provides financial reimbursements for the transportation cost of relocating litter from a Delaware farm to an alternative use project or another farm for land application. In 2005, the Commission funded the transportation costs of relocating 35,770 tons. Perdue AgriRecycle processed 34,000 tons and transported 15,052 tons without cost assistance from the Commission. There is an application process that validates eligible senders, receivers, truckers and alternative use projects. Excess litter continues to be transported for land application throughout Delaware as well as Maryland, New Jersey and Virginia. Alternative use projects are also essential for managing excess poultry litter. The Nutrient Management Program relocates 6,460 tons of Delaware litter to mushroom producers in Pennsylvania.

The Perdue AgriRecycle pellet-fertilizer plant located in Blades, Delaware, continues to process excess poultry litter. In 2005, the plant processed a total of 56,600 tons, 34,100 tons being Delaware generated. Since July 2001, Perdue AgriRecycle has marketed and shipped out 131,000 tons. Also Perdue AgriRecycle relocated 15,052 tons of raw poultry litter to land owners for crop production without cost assistance through the Nutrient Relocation Program.

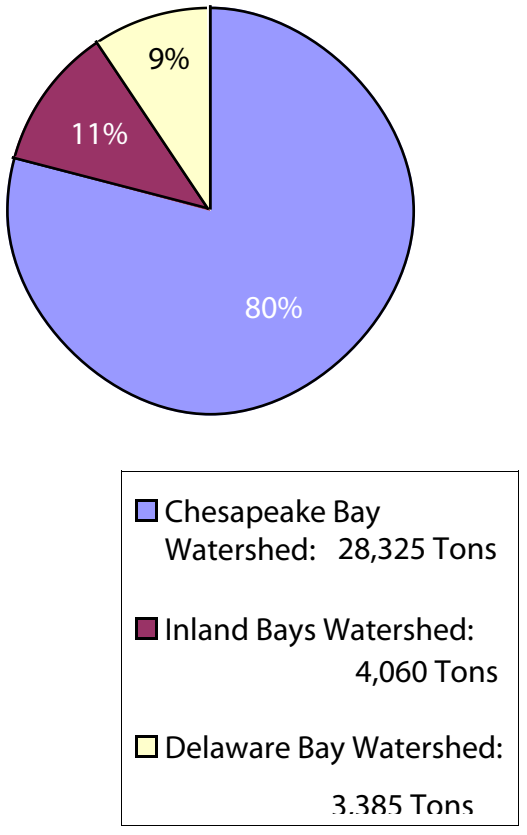


The Perdue AgriRecycle serves as an important alternative for excess litter. In 2005 they processed 56,000 tons of product, 34,000 generated in Delaware.

2005 Poultry Litter Relocation from Delaware Watersheds

Chesapeake Bay Watershed:	28,325 Tons
Inland Bays Watershed:	4,060 Tons
Delaware Bay Watershed:	3,385 Tons

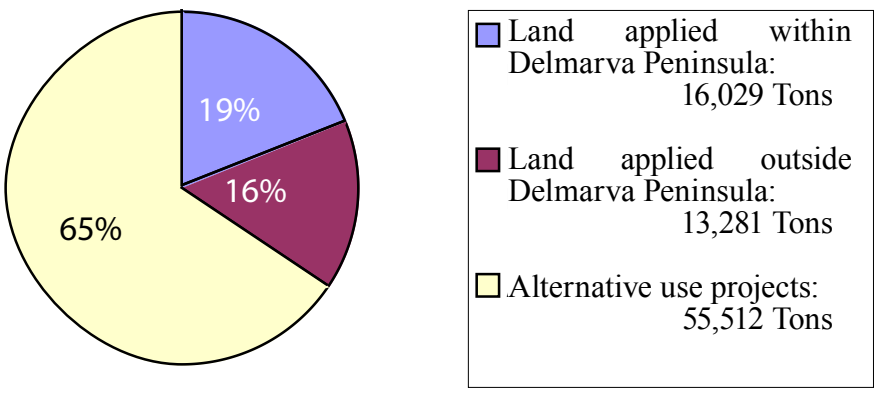
2005 Relocation by Delaware Watershed



2005 Relocation and Alternative Use

Land applied within Delmarva Peninsula	16,029 Tons
Land applied outside Delmarva Peninsula	13,281 Tons
Alternative use projects	55,512 Tons

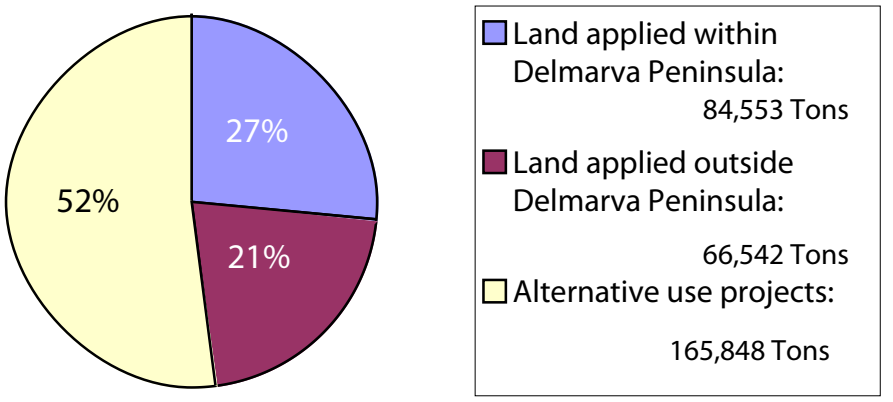
2005 Relocation and Alternative Use
Total 84,822 tons



Relocation and Alternative Use to date

Land applied within Delmarva Peninsula	84,553 Tons
Land applied outside Delmarva Peninsula	66,542 Tons
Alternative use projects	165,848 Tons

Relocation and Alternative Use Projects since 2001
Total 316,943 tons



Relocating excess poultry litter is occurring across the state as many farms are limited to phosphorus based applications. The Commission annually expends $546,000 of transportation funds provided by state general funds and federal funds distributed by DNREC Water Resources and Soil and Water Divisions.

Farmers and others wishing to participate in the relocation projects can register with the nutrient management matching service by contacting (302) 698-4500. The Relocation Program provides farmers with the option to move the litter themselves or hire a broker.

Nutrient Management Planning

Any business operation that applies nutrients to greater than ten acres or manages 8,000 pounds of animals will be affected by mandatory nutrient management. These people are randomly selected in 20% increments, which started in 2003 and will complete in 2007. They are affected by the following requirements:

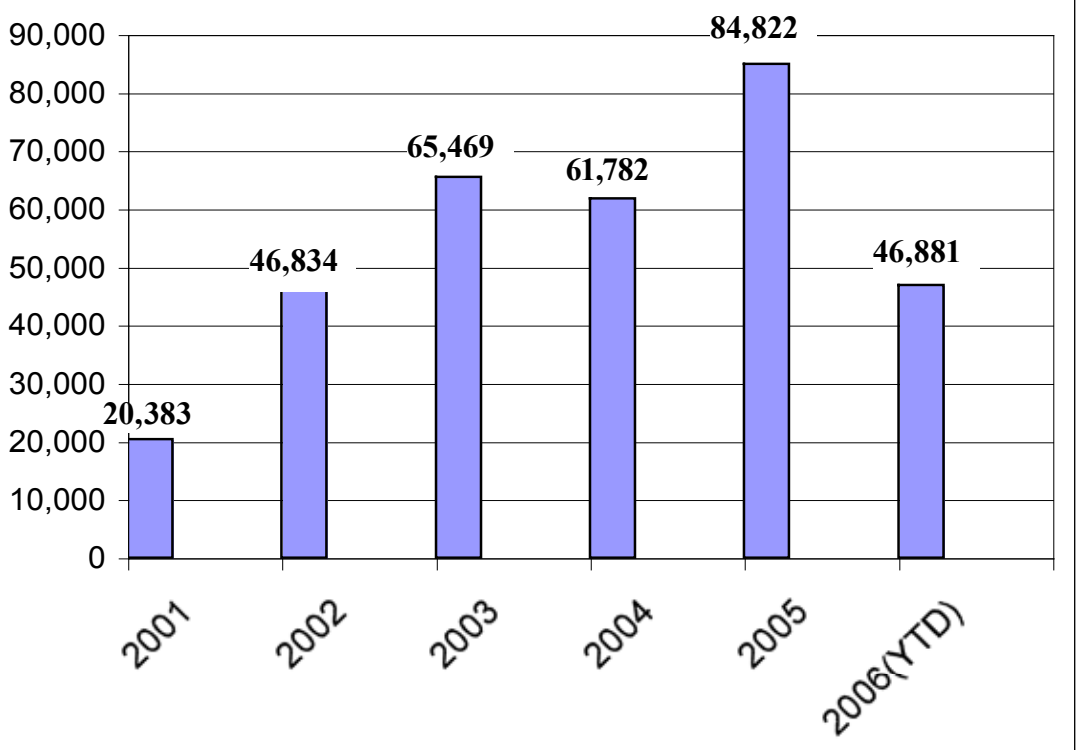
1. Development of a nutrient management plan or animal waste management plan. These plans can be developed by nutrient consultants located at Kent and Sussex Conservation Districts or by private consultants funded by the Commission;
2. Maintenance of nutrient handling records. Record keeping books have been developed and distributed to simplify requirements;
3. Submit annual report. A one page nutrient information form must be provided by March 1st, the year after mandatory nutrient planning;
4. Become certified. Certification deadline was January 1, 2003. Initial certification classes are offered two times a year throughout the state and the dates are posted on the website. (See contact information on Page 16.)

Although nutrient planning practices are phased in over five years, many nutrient handlers have volunteered as early cooperators. Volunteer efforts and the mandates have resulted in the establishment of nutrient management plans for 112,477 acres during 2005. To date, 388,841 acres (85%) of agricultural crop land is managed under Commission approved nutrient management practices.

Planning and Implementation Costs

Funds for nutrient management planning and implementation are provided by State and Federal sources. The Commission expends an average of $451,800 for the reimbursement of costs associated with developing a nutrient management plan by a private nutrient consultant. The Natural Resources Conservation Service (NRCS) obligated $249,591 in FY 2005

Relocation Progress and Alternative Use since 2001 (in tons)

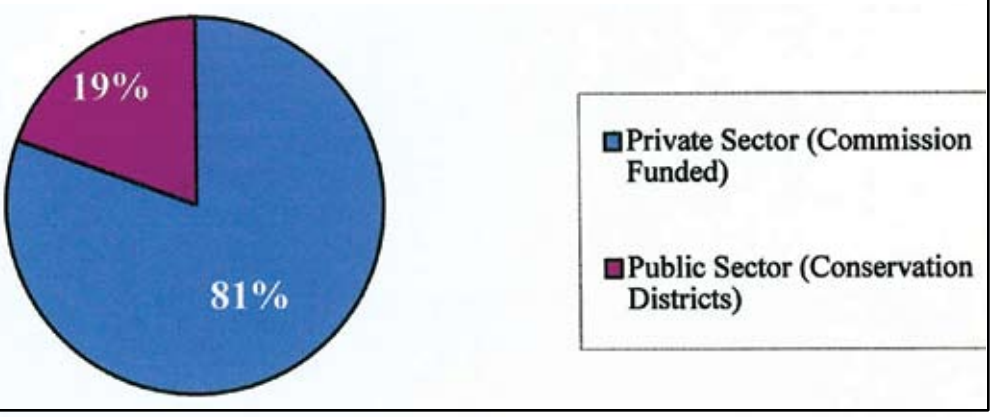


Nutrient Management Plan Development for 2005

Private Sector (Commission Funded)	90,838
Public Sector (Conservation Districts)	21,639

Nutrient Management Plan Development for 2005

Total 112,477 Acres

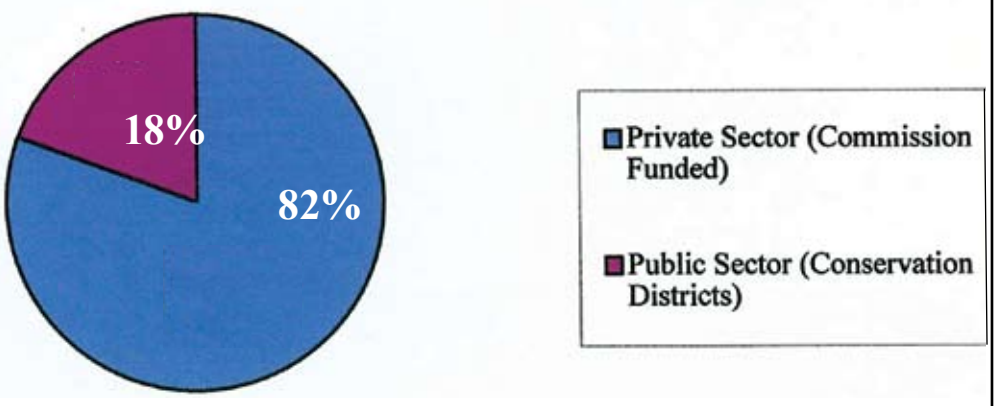


Acreage Managed Under a Current Nutrient Management Plan

Private Sector (Commission Funded)	333,370
Public Sector (Conservation Districts)	71,639

Nutrient Management Planning since 2001

Total 388,841 Acres



The current nutrient management planning represents crop years 2003, 2004 and 2005.

Demonstration projects of animal mortality burial indicate that ground water contamination occurs and is not the correct solution for managing animal mortalities. Composting, rendering or incineration are the common and appropriate practices. (Malone, G., W., 2003. Shallow trench burial demo. University of Delaware Research and Education Center.)

for expanded nutrient management planning practices. These practices affect 22,358 acres and include practices such as phosphorus site indexing, precision soil sampling, precision record keeping, controlled release fertilizer use and others.

Public Nutrient Consultants also help with the workload of developing plans. During 2005, Kent and Sussex Conservation Districts made available seven certified public consultants for the development of animal waste management plans and/or nutrient management plans. The Department of Natural Resources and Environmental Control (DNREC) obligates annually $265,555 of section 319 Clean Water Act funds for the cost of eight conservation and nutrient management planners (NPS Annual Report, 2004). The University of Delaware Extension Services also assist farmers in developing nutrient management plans. As summarized, there are many private and public organizations that provide the resources needed to implement the Nutrient Management Law.

Nutrient Management Implementation goes beyond the development of a plan and depends on a wide array of Federal, State and local resources. In general, implementation costs are for manure handling structures and in-field conservation practices that protect and conserve the environment. The funding sources follow and reflect expenditures and or obligations for FY 2005:

1. Federal funds from NRCS: $3,308,272 for structures and conservation practices such as manure management, mortality management, heavy use protection, cover crops, vegetative buffers, environmental windbreaks, and other practices
2. State funds from DNREC: $1,705,000 for structures such as manure management, mortality management and cover crops.
3. State funds from the Commission: $546,000 for poultry litter relocation.

Nutrient Management Plan Audits

A fraction of all nutrient management plans developed and reported to the Commission are audited to instill high standards for those operations requiring nutrient management. The Commission's goal is to audit 10% of nutrient management plans developed each year. This process helps to ensure that plans are meeting the requirements of the law and that they are being utilized. During 2005, program staff audited nutrient management plans for 15 agricultural operations and 3 non-agricultural operations.

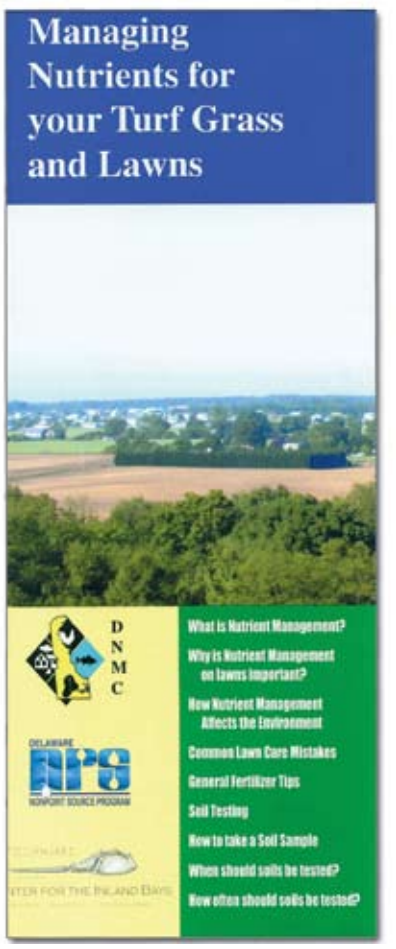
As a result of nutrient management audits all legal discrepancies identified involved a follow up meeting with farm management and in many cases the certified nutrient consultant. The common discrepancy was incomplete recordkeeping. As a result of the 2005 audits, all discrepancies were disclosed and resolved except for one case where a nutrient handler was not certified. This case was eventually resolved after formal administrative actions.

Nutrient Management Financial Audits

To insure integrity in the use of public funds, program staff completed eight financial audits of the total program distributions valued at $997,800. Four audits were conducted on participants of the relocation program and four on the participants of the nutrient planning reimbursement funds. These audits demand proper accounting practices and will continue annually.

Urban Nutrient Management

In partnership with The Center for the Inland Bays and the 319 Delaware NonPoint Source Program, nearly 175,000 brochures were designed, printed and distributed over the past three years. The brochure targeted smaller properties in urban and suburban areas. *Managing Nutrients for your Turf Grass and Lawns* is a concise but informative brochure available to homeowners. Help from garden centers, fertilizer stores, University extension offices, other public offices and direct mailings contributed to this project, which started in 2003.



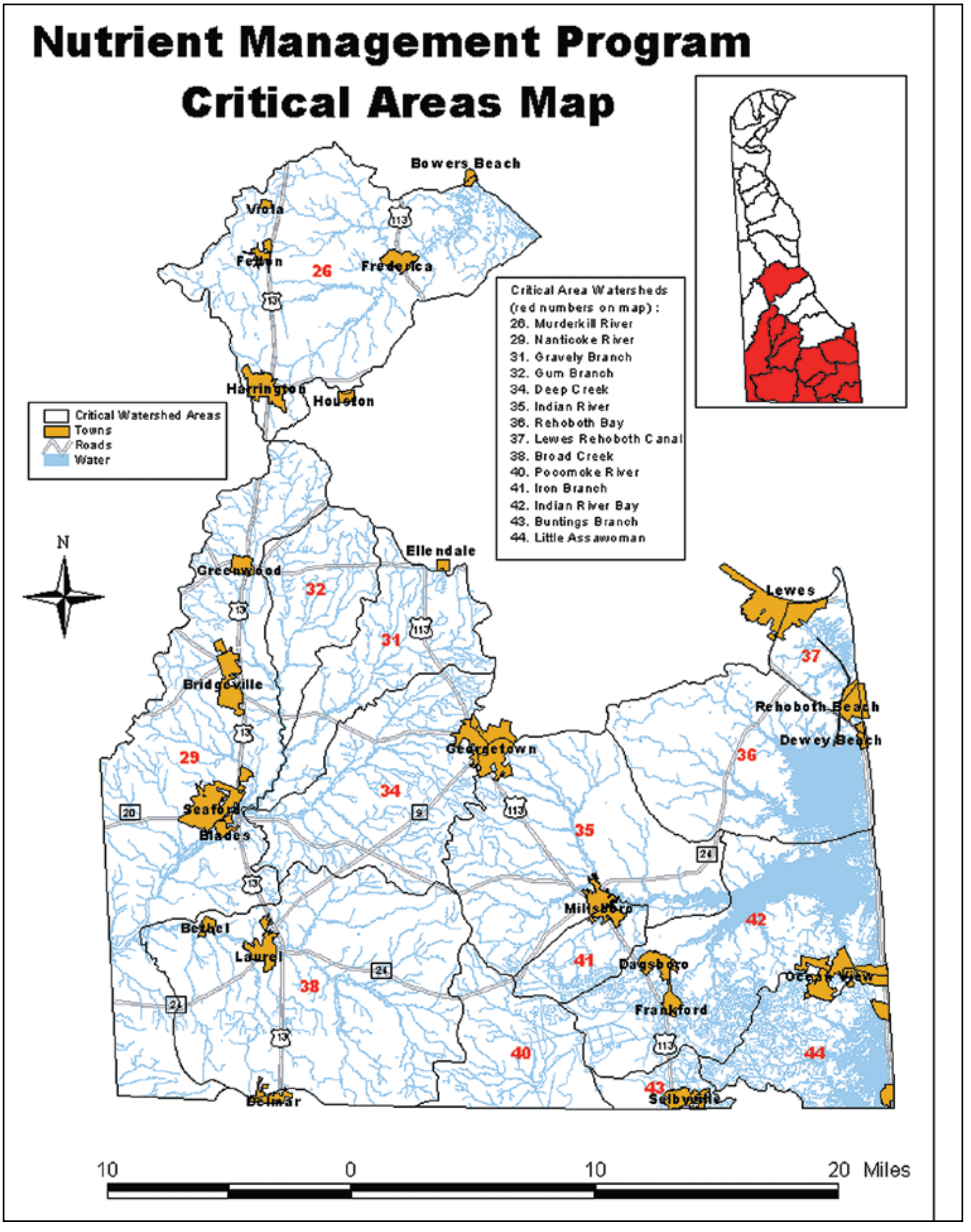
Proper nutrient management is important for all nutrient handlers, including lawn care companies.

Nutrient management awareness and education is important for farmers, policy makers and the general public.

Nutrient Management Critical Areas

The Commission has established a "critical areas" map to help set priorities for the Nutrient Management Program. Such priorities include nutrient relocation involvement for the export of excess poultry litter.

These critical areas encompass most of Sussex County and a portion of Kent. They include the Inland Bays, Nanticoke, Pocomoke and the Murderkill watersheds. The Commission's choices were based on the impaired-waters list developed by the Department of Natural Resources and Environmental Control, the level of livestock production within those watersheds and input from the Tributary Action Teams.



Nutrient management critical areas as established by the Delaware Nutrient Management Commission.

Permits for Certain Animal Operations

The Commission and Secretary of Agriculture continue to take an active role in addressing national pollution permit regulations for Delaware animal feeding operations. The 1972 Clean Water Act and 2003 Federal regulations require permits for some farms called Concentrated Animal Feeding Operations (CAFOs).

The Nutrient Management Law and a current agreement between the Environmental Protection Agency (EPA), DNREC, Department of Agriculture (DDA) and the Commission have authorized the Nutrient Management Program to implement regulations for CAFOs. This agreement outlines responsibilities for each agency. Such responsibilities

include the Nutrient Management Program as the initial enforcement effort for all CAFOs prior to actions from DNREC and or EPA.

Delaware CAFO regulations were presented to the agricultural community during the summer of 2005 and later became effective September 12, 2005. These regulations were the result of a culmination of efforts that started in 2001. All policy decisions were conducted in a public forum of the Commission and recommended to the Secretary of Agriculture and the Secretary of Natural Resources and Environmental Control. Major contributors to the process include DNREC Water Resources, Natural Resources Conservation Service, University of Delaware and several interest groups representing agriculture and environmental conservation.

A CAFO permit is required when a farm experiences a discharge to the environment. The CAFO requirements are activated when a farm owner and manager sign and submit a Notice of Intent (NOI) to comply with regulations that prohibit a discharge. Portions of the nutrient management plan must accompany the NOI. In general, a discharge occurs when animal manure is not stored and/or handled correctly or when manure is over applied as defined by the nutrient management plan. Animal operations may also voluntarily sign a NOI, as some have, for the legal protection that demonstrates no-discharge on that particular farm.

During 2005, the following animal feeding operations were managed according to the requirements of the CAFO regulation:

CAFO Name	Animal Type	Operation Capacity	Town
Schiff Farms Inc.	Feeder Beef	4,000	Whitleysburg
Delaware Park	Competition Horses	1,500	Wilmington

In conclusion, a Federal permit may be requested or required by an animal feeding operation. A permit requires the farm operation to prevent any discharge to the environment under weather condition less severe than a 25 year rain event, or approximately 6.3 inches of rain within a 24 hour period. A nutrient management plan, records of implementation, annual report, certification and other details are required by the permit.

Best Management Practices

The Nutrient Management Commission promotes best management practices, which are actions that can help reduce nutrient runoff. These management practices are the backbone of nutrient management and will have short-term and long-term results on water quality. They include such practices as proper soil and manure sampling, proper timing and methods of fertilizer (commercial and manure) application, manure handling and proper storage, the planting of cover crops and vegetative buffer strips near sensitive areas, erosion control, the proper disposal of dead animals and general conservation practices.

County-by-County Report

The Commission works cooperatively with county conservation districts to promote and implement nutrient related best management practices. Many practices that are coordinated by the Conservation Districts result in success that helps both the environment and the farmer. Kent and Sussex Conservation District offices staff a total of seven Conservation Planners who work with nutrient handlers. They develop nutrient management plans (see nutrient management planning in this report) and address many other conservation practices for farmers and property owners. The following is a 2005 summary of the Districts accomplishments:

New Castle County
Manure storage structures - 2
Acres planted with cover crop –3,355
Poultry carcass composters -1
Conservation plan development acres – 14,090

Kent County
Manure storage structures - 14
Poultry carcass composters -8
Acres planted with cover crop – 6,842
Pre-sidedress soil nitrate test - 61 samples representing 1,905 acres
Conservation plan development acres – 24,157

Sussex County
Manure storage structures - 5
Poultry carcass composters - 22
Acres planted with cover crop – 34,999
Pre-sidedress soil nitrate test – 124 samples representing 5,551 acres
Conservation plan development acres – 9,683

In conjunction with county and federal Conservation District offices, the Commission developed a *Nutrient Management Best Management Practices* source book, which provides nutrient handlers a list of recommended practices. These practices will be part of nutrient management planning that will help reduce nutrient pollution.

The source book has been distributed to all certification participants and provides a detailed explanation of 56 practices. The following practices represent a summary of the Commission approved best management practices that can also be found on the website:

- Poultry Feed Related Amendments such as Phytase that make nutrients such as phosphorus more available during digestion and so reduce Phosphorus in manure.
- Poultry Litter Amendments such as Alum that when added binds soluble Phosphorus in litter and reduces odor and ammonia emissions.
- Roof Runoff Management in Feedlots that prevents clean water from coming into contact with animals or manure.
- Storm Water Control in Feedlots that prevents clean storm water from becoming contaminated by flowing through feedlot and coming into contact with animals or manure.
- Temporary storage of poultry litter must be managed and handled to best protect the environment and provide operational flexibility.
- Pasture Stream Fencing to act as a barrier between pastureland and a watercourse to exclude animals from ditches and streams.
- Liquid and Non-Liquid Manure Handling for Long-term and Short-term storage ranging from temporary field storage of dry manure to systems for the collection, transportation, storage, and disposal of liquid manure and contaminated runoff in a manner which does not degrade air, soil, or water resources.
- Animal Mortality Handling can range from a composting facility for the biological treatment of daily accumulation of dead animals to composting methods to deal with large scale catastrophic mortality.
- Analysis and Testing of soil, manure and plant tissue are valuable tools for determining available nutrients in each of these components.
- Phosphorus Management such as conducting phosphorus site index, saturation ratio and feed management.
- Nutrient Application Equipment Calibration and Adjustment are necessary to ensure nutrients are applied evenly and at known rates to avoid over application.
- Residue Management and Tillage Practices can contribute to improved water quality while reducing soil erosion, increasing infiltration and organic matter, improving soil structure, and reducing compaction and crusting.
- Sustainable pasture management maintains vegetative growth with a balanced animal density to protect the soil and prevent nutrient and manure runoff.
- Conservation practices for drainage ditches and other water bodies to prevent nutrient runoff.

Stockpiling and Temporary Field Storage of Poultry Litter Standards

The following best management practices reference temporary storage of poultry litter that affect all poultry operations and anyone utilizing poultry litter.

The most efficient method of handling and storing poultry litter results from handling the poultry litter as few times as possible. Ideally, total cleanouts and crust outs are immediately land-applied, transported to an alternative use or to a storage structure. However, timing considerations may require temporary outdoor storage of the litter before use, which must be conducted while implementing best management practices.

In situations where temporary field storage is needed, litter may be stored temporarily to preserve litter quality and prevent application at the wrong time of the year. Temporary field storage is the least preferred storage practice but may be conducted according to the following standards:

Stockpiling and Temporary Field Storage of Poultry Litter Standards

Production Area Storage	Non-Production Area Storage Up to 90 Days	Non-Production Area Storage Over 90 Days to 150 Days
"Production Area" means that part of an Animal Feeding Operation that includes the animal confinement area, the manure storage area, the raw materials storage area and the waste containment areas, also includes egg washing or processing facility and any area used in the storage, handling, treatment or disposal of mortalities. The Production Area should be defined in the operation's Nutrient Management Plan.	Temporary Field Storage away from the "Production Area" can be staged for land application and is limited to 90 days without the use of an impervious cover.	For conditions that require temporary storage of litter beyond 90 days, individual or general authorization may be granted by the DNMC or Delaware Department of Agriculture for storage up to 150 days. For any storage greater than 150 days, an impervious cover is required.
Stockpiling storage within the "Production Area" (as defined above) is limited to 14 days without the use of an impervious cover.		
The following BMP(s) are required for Production Area Storage: 1. The stockpile must be separated from any channeled runoff, standing water and other drainage systems such as roof runoff and down spouts. These following additional BMPs are required for Production Area Storage of 2-14 days: 2. The stockpile must be at least 6 feet high; and 3. The stockpile site must meet Natural Resources Conservation Service (NRCS) standard or other containment area lining (standards) approved by the DNMC.	The following BMPs are required for Non-Production Area Storage Up to 90 days: 1. The pile must be at least 6 feet high and in a conical cross section shape; and 2. Litter shall not consist of more than 5% crust out material; and 3. The selection of the temporary storage site must consider the highest, most practical site possible and shall not use the same site more than once every two years without a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; and 4. The temporary storage sites must be identified in the nutrient management plan; and 5. The site must be located at least 100 feet from a public road, 100 feet from any surface water and 200 feet from any residence not located on the property; and 6. The site must be at least 200 feet from a domestic well and 300 feet from a public water supply well; and 7. Post litter removal treatment must include the removal of all litter and the top 1-2 inches of topsoil if the topsoil is co-mingled with the litter to prevent nutrient loads; and 8. A production crop or cover must be established and maintained at the site as soon as practical following post removal treatment. 9. For temporary storage sites on soils classified as located within 1.5 feet of the depth to the seasonal high water table, any one of the following practices must be implemented: a. The establishment of a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; or b. The use of high carbon (content) material (straw, wood shavings, fodder) as the base of the pile at least 8 inches thick to serve as a barrier and easy post storage removal; or c. The use of powdered bentonite or similar material that will seal the area under the pile.	The following BMPs are required for Non-Production Area Storage Over 90 days: 1. The pile is to be constructed as large as possible and be at least 10 feet high and in a conical cross section shape; and 2. Litter shall not consist of more than 5% crust out material; and 3. The selection of the temporary storage site must consider the highest, most practical site possible and shall not use the same site more than once every two years without a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; and 4. The temporary storage sites must be identified in the nutrient management plan; and 5. The site must be located at least 100 feet from a public road, 100 hundred feet from any surface water and 200 feet from any residence not located on the property; and 6. The site must be at least 200 feet from a domestic well and 300 feet from a public water supply well; and 7. Post litter removal treatment must include the removal of all litter and the top 1-2 inches of topsoil if the topsoil is co-mingled with the litter to prevent nutrient loads; and 8. A production crop or cover crop must be established and maintained at the site as soon as practical following post removal treatment; and 9. A 24-foot vegetative crop must be planted and maintained surrounding the pile. 10. For temporary storage sites on soils classified as located within 1.5 feet of the depth to the seasonal high water table, any one of the following practices must be implemented: a. The establishment of a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; or b. The use of high carbon (content) material (straw, wood shavings, fodder) as the base of the pile at least 8 inches thick to serve as a barrier and easy post storage removal; or c. The use of powdered bentonite or similar material that will seal the area under the pile.

Formal Agreement with Poultry Companies

The Nutrient Management Commission continues to implement the agreement outlined in the 2001 Memorandum of Understanding. The document was signed January 8, 2001 by the chief executives of all poultry companies operating in Delaware, DDA and DNREC. The agreement was for the purpose of identifying responsibilities of all parties in the effort of implementing nutrient management. The poultry companies adopted general guidance and leadership roles in promoting environmental protection within the companies and contracted growers. The document expands on the legal requirement to submit an annual report to the Commission outlining the accomplishments and strategy for nutrient management. The annual reports are submitted by Allen's Hatchery Inc., Mountaire Farms of Delmarva, Mountaire Farms of Delaware and Perdue Farms Inc. The reports entail the following nutrient management subject matters for company owned farms and contracted farms:

1. Compliance with the Nutrient Management Law;
2. Litter and manure management;
3. Technical assistance;
4. Alternative use and excess litter;
5. Feed formulation for Phosphorus management;
6. Research projects;
7. Financial commitment;
8. Education.

The cooperative agreement with Allen's, Mountaire and Perdue has generated results that benefit the state, poultry industry, contract growers and the general public. Highlights of the 2005 reports follow:

1. All poultry companies continue to sponsor and fund the Environmental Stewardship Program;
2. All flock supervisors and many company employees are certified as nutrient handlers;
3. All contract growers are provided with educational material relating to technical and legal requirements;
4. All companies are committed to alternative use options for excess poultry litter generated by the company and contracted farms;
5. All companies continue to explore and research phosphorus management in feed;
6. All companies utilized phytase amended feed with significant reductions in Phosphorus.

Poultry feed that is delivered to contract growers is amended with phytase, which results in a 23% reduction in manure litter phosphorus. (Saylor, 2005)

Phosphorus Management and Phytase

Managing phosphorous properly is required in the Nutrient Management Law by restricting phosphorous applications to the crop removal rate. Phosphorous based manure applications can be managed and applied as a three year crop removal rate. Excess poultry litter is managed by nutrient generators participating in the Relocation Program and alternative use projects such as the Perdue AgriRecycle plant. Phosphorous is also managed in the feed formulations of the poultry companies. Phytase is significantly helping the industry better manage phosphorus in the feed and litter.

The crop removal rate is significant in determining the phosphorus application rate.

Phytase is an enzyme currently added to poultry feed at the mill that helps broilers and other poultry utilize more indigestible (phytic acid) phosphorus. This in turn reduces the need to add supplemental phosphorous to the feed and also reduces the phosphorous concentration in the litter. Reports indicate that phytase has decreased phosphorous content in litter by about 23% (Saylor, 2005). Recent poultry litter analysis has identified an average of 44 lbs. phosphorous (P_2O_5) per ton (Hansen, 2005). Analysis prior to 2001 was commonly seen at 60-70 lbs. P_2O_5 per ton. A total 27-37% phosphorus reduction is a result from phytase, litter amendments and overall litter handling. The use of phytase is one of several strategies needed to meet the intent of the Delaware Nutrient Management Law.

Managing field runoff and drainage ditches are important in reducing nutrient runoff.

Budget

The Nutrient Management Commission's accomplishments were made possible by funding provided by the Legislature and Governor Minner. The Nutrient Management Program is well into implementing nutrient planning, relocation and mandated activities as required by the Nutrient Management Law. The law requires full implementation of the program by January 2007.

Budget request for Fiscal Year 2007:

FY 2005 Budget Budget	FY 2006 Budget	FY 2007 Requested	
Program Operating Costs:			
Personnel	221,700	233,300	253,800
Federal Funds section 319 (Clean Water Act)	***20,000***	***26,100***	***29,600***
Travel	4,000	4,000	4,000
Contractual	17,000	17,000	17,000
Supplies	4,000	4,000	4,000
Information/Education/Certification	221,000	221,000	221,000
Nutrient Relocation Program	***246,000***	***246,000***	***246,000***
Federal Funds section 319 (Clean Water Act)	***200,000***	***200,000***	***200,000***
Federal Funds Ches. Bay Program	***100,000***	***100,000***	***100,000***
Nutrient Management Planning	451,800	451,800	451,800
Research and Demonstration	0	160,000	0
TOTAL	**$1,485,500**	**$1,663,200**	**$1,527,200**

Note: The above Requested Budget was approved by Governor Minner as part of the 2007 operating budget.

Delaware Environmental Stewardship Program

The Commission partnered with three poultry integrators to select and recognize the 2005 environmental stewards. Allen's Family Food Inc., Mountaire Farms Inc. and Perdue Farms, Inc. funded the 2005 stewardship program, which was designed to recognize smaller poultry farms.

The Environmental Stewardship program was established in 2001 to recognize farmers whose stewardship and general farm practices contribute to the conservation of the environment, water quality and farmland. The program recognized growers by evaluating nutrient management, best management practices, farm management, innovation, biodiversity and wildlife management.

The 2005 Delaware Environmental Stewardship was awarded to three farm families during the 2006 Governor's Conference on Agriculture. Joseph E. and Denise Calhoun of Dagsboro were awarded the top award and received a cash award of $2,500, a lane sign (see photo) and a plaque.

Jerrel and Alma Heatwole of Greenwood, Delaware and Jack D. and Kathy Snyder of Millsboro were also awarded with a cash award of $250, a lane sign (see photo) and a plaque.

Below, from left to right: Tom Brinson (Allen's Family Food), Alma Heatwole (2005 finalist), John Chlada (Perdue Farms), Kathy Snyder (finalist), Jack Snyder (finalist) Denise Calhoun (recipient), Joe Calhoun (recipient), Jeff Smith (Mountaire Farms), and Bill Vanderwende (DNMC Chairman).

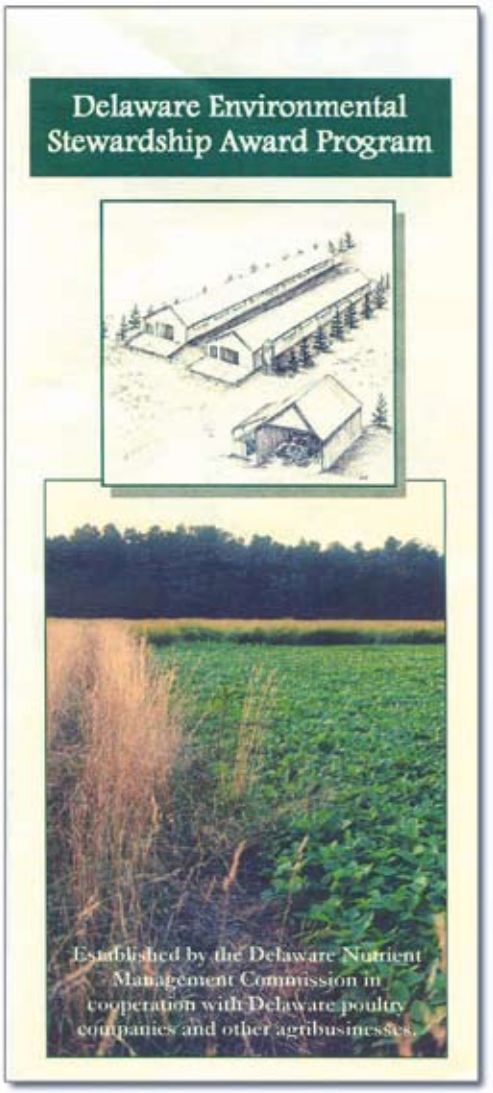
Past Environmental Stewardship Program Award Winners:

2004
Richfield Farms;
John Mills,
Greenwood

2003:
Ronald and Scott
Webb, Greenwood

2002:
Roland and Laura Hill,
Lewes

2001:
Charles P. West II,
Gumboro



Call (302) 698-4500 today for an Environmental Stewardship Program brochure

Complaint Resolution

Complaints related to manure management and general nutrient management practices are handled and resolved by program staff. Formal complaints against any alleged violation of the Nutrient Management Law, regulations or standards are investigated by program staff and recommended for action by the Commission.

The Nutrient Management Program and Commission have taken action on thirty-four formal complaints and/or alleged violations. Nine were for failing to meet the certification deadline and 25 for failure to respond to Mandatory Nutrient Management Plan Regulations. Four of the 34 alleged nutrient management violation cases proceeded to a Commission hearing. All four cases were found to be in violation of the Nutrient Management Law.

During 2005, 37 informal complaints were received and resolved relating to manure management, livestock management, odor and livestock mortality handling. The categories of complaints and operation types are summarized and follow:

Complaint Category

Manure management	38%
Animal mortality management	24%
Miscellaneous	19%
Manure odor	14%
Nutrient Management Certification	5%

Operation Type

Poultry	62%
Horse	8%
Field Crop Only	8%
Dairy	8%
Cattle	6%
Lawn Care	6%
Swine	2%

University of Delaware Demonstration plots compared poultry litter application rates of 1.5, 3, 6 and 8 tons/acre on dry land corn. The results indicated that there is no yield benefit in applying more than 3 tons/acre (Binford, G. 2001. Delaware Nutrient Management Notes. University of Delaware).

Horse farms must also comply with nutrient management standards. Manure storage, roof runoff, animal wash-down sites and other practices are common focal practices for horse farms.

As the population grows, so does the awareness for proper manure handling and the need for complaint resolution.

Recommended Incentives

As the Nutrient Management Program approaches full implementation, the Commission recommends continued financial commitment to research priorities, nutrient management planning, nutrient relocation and best management practices. Expenses incurred as a result of regulatory requirements or voluntary efforts to implement most nutrient management practices would significantly reduce the profitability of agriculture if not assisted by public funding. Adequate funding is the key to successfully implementing the Nutrient Management Program.

References

Hansen, D., Nelson, J., Binford, G., Sims, T., Saylor, W. 2005. *Phosphorus in Poultry Litter: New Guidelines from the University of Delaware.* College of Agriculture and Natural Resources, University of Delaware, Newark, DE

NonPoint Source Program (NPS) *Annual Report.* 2004. Agriculture, Delaware's Conservation Districts, p. 2.

Saylor, W., Sims, T., Angel, R. 2005. *Modifying Diets with Phytase: Mode of Action and Effects on Litter Phosphorous.* University of Delaware and University of Maryland.

Background & Contacts

What is the Delaware Nutrient Management Commission?

The Nutrient Management Law established a 19-member Commission that is charged to develop, review, approve, and enforce regulations governing the certification of individuals engaged in the business of land application of nutrients and the development of nutrient management plans. The members of this Commission come from many different backgrounds and professions.

Mission statement

The Delaware Nutrient Management Commission's official mission is:

"To manage those activities involving the generation and application of nutrients in order to help improve and protect the quality of Delaware's ground and surface waters, sustain and promote a profitable agricultural community, and to help meet or exceed federally mandated water quality standards, in the interest of the overall public welfare."

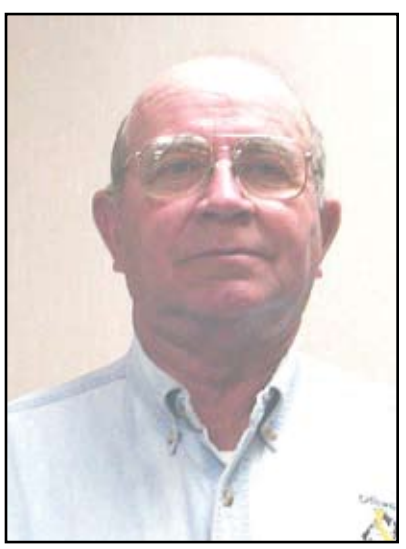
Public meetings of the Delaware Nutrient Management Commission are held monthly at the Delaware Department of Agriculture.

What are the Commission's responsibilities?

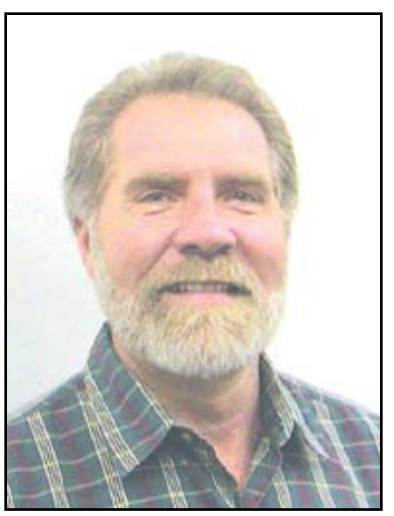
The Delaware Nutrient Management Commission will:

1. Consider establishing critical areas for voluntary and regulatory programs.
2. Establish Best Management Practices to reduce nutrients in the environment.
3. Develop educational and awareness programs.
4. Consider incentive programs to redistribute nutrients.
5. Establish the elements and general direction of the State Nutrient Management Program.
6. Develop nutrient management regulations.

Members of the Nutrient Management Commission

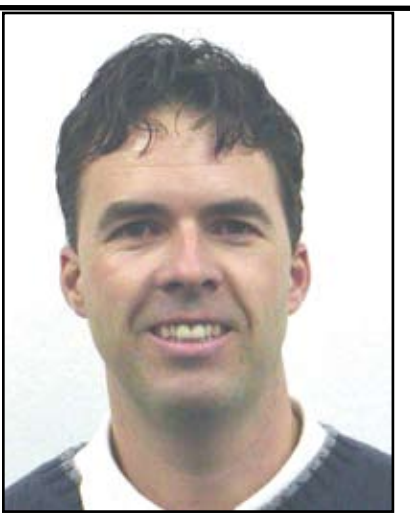


William Vanderwende, Commission Chairman, was appointed to the Commission by the Senate, and was named Chairman by the Governor. He is a full-time Sussex County dairy producer who represents the state's dairy industry. He operates a farm with 700-head of dairy, and 3,000 crop acres. He can be reached at (302) 349-4423.



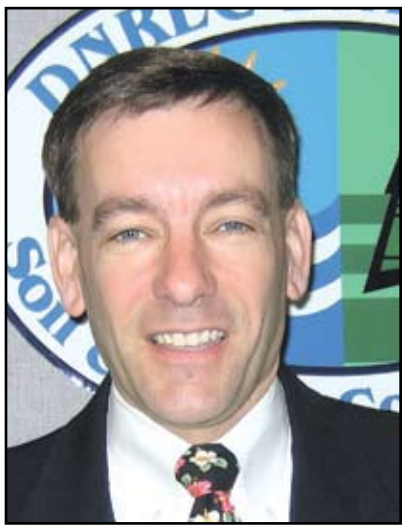
David Baker, Commission Vice Chairman and Chairman of the Planning Subcommittee, was appointed by the Senate as a representative of the New Castle County grain industry. He is a full-time grain farmer of 3,000 acres. He can be reached at (302) 378-3750.

Mark Adkins was appointed by the Governor to represent swine farmers. He operates a 900 acre family grain farm and 1,000 swine farm and is a director of Delaware Swine Producers. He can be reached at (302) 732-3007.

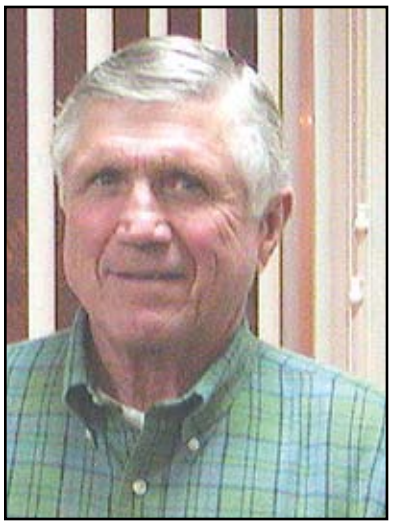


Ed Lewandowski, Chairman of the Rules and Regulations Subcommittee, was appointed by the House of Representatives as an Environmental Advocacy Group representative. He is currently the Executive Director at the Center for the Inland Bays. He can be reached at (302) 645-7325.

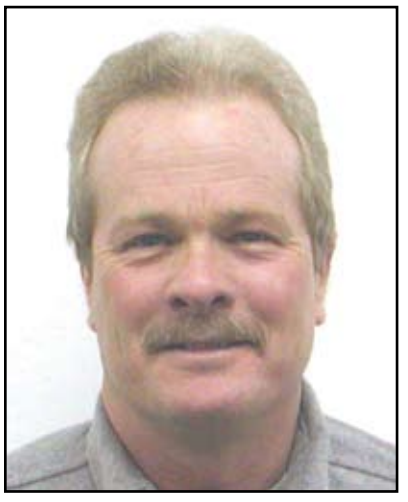
Robert Baldwin, Director of the Department of Natural Resources and Environmental Control Division of Soil & Water Conservation, is appointed by the Nutrient Management Law. He can be reached at (302) 739-9921.



Jack Manchester was appointed by the Governor as a New Castle County public citizen representative. He is a member of the Delaware Environmental Alliance for Senior Involvement (DELEASI) and a retired chemical engineer. He can be reached at (302) 994-5544.



Carlton Fifer was appointed by the Senate. He represents the Kent County vegetable industry, and operates a 2,500-acre fruit and vegetable farm. He can be reached at (302) 697-2141.



Bud O'Neill was appointed by the Governor as a representative for the golf course/lawn care industry. He owns an agronomic service firm that plans and manages Turfgrass for golf courses, athletic complexes and lawns. He is past chairman of the Delaware State Golf Association greens section and can be reached at (302) 653-8618.

Tony Keen, Chairman of the Technology Subcommittee, was appointed by the Senate as a nutrient consultant. He has owned and operated a private crop consulting firm since 1980. He can be reached at (302) 684-5270 (work) or (302) 684-3196 (home).

Brian Schilling, Chairman of the Industry Relations Subcommittee, was appointed by the House of Representatives to represent commercial agricultural nutrient applicators. He is a nutrient consultant and manager of a local agricultural cooperative. He can be reached at (302) 932-7684.

Connie Larimore, Chairman of the Budget Subcommittee was appointed by the House of Representatives to represent Kent County poultry producers. She owns a 50,000-capacity poultry operation and 150-acre grain farm. She can be reached at (302) 398-8304 or (302) 270-7053.

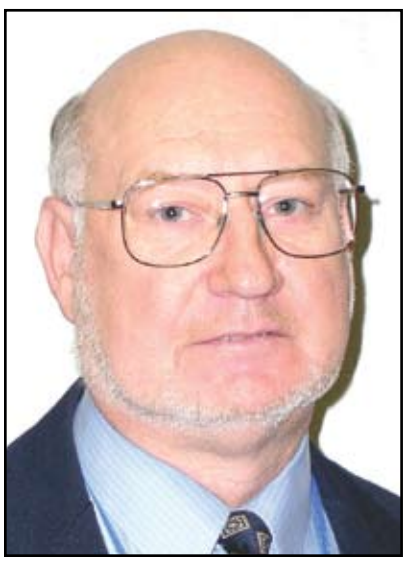
Carl Solberg, Chairman of the Program & Education Subcommittee, was appointed by the Senate. He represents the Environmental Advocacy Group, and is a volunteer for the Delaware Chapter of the Sierra Club. He can be reached at (302) 678-2690.

Richard Sterling was appointed by the Governor as a representative of the commercial nursery industry. He operates a 75-acre nursery specializing in evergreens. He can be reached at (302) 653-7060.

Charles West II was appointed by the House of Representatives to represent Sussex County Poultry producers. He has an 88,000 broiler operation. He can be reached (302) 238-0137.

John Hughes, Secretary of the Delaware Department of Natural Resources and Environmental Control, is an ex-officio member of the Commission. He can be reached at (302) 739-4403.

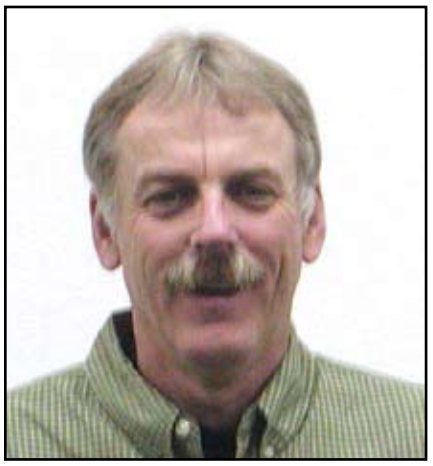
Michael Scuse, Secretary of the Delaware Department of Agriculture, is an ex-officio member of the Commission. He can be reached at (302) 698-4500.



Dr. Gerald Llewellyn serves for Secretary Vincent Meconi and is currently Chief of the Environment Health Evaluation Branch at the Division of Public Health, within the Department of Health & Social Services (DHSS). His position is ex-officio and he can be reached at (302) 744-4540.

Nutrient Management Program Staff

William Rohrer Jr., is the Administrator of the Delaware Nutrient Management Program and an ex-officio member of the Nutrient Management Commission. He can be reached at (302) 698-4500.



Steve Hollenbeck is the Environmental Coordinator for the Delaware Nutrient Management Program. He can be reached at (302) 698-4500.

Maryann Pielmeier is the Administrative Specialist for the Delaware Nutrient Management Program. She can be reached at (302) 698-4500.

Judy Baines is the Office Assistant for the Delaware Nutrient Management Program. She can be reached at (302) 698-4500.

University of Delaware Nutrient Staff

Several specialists from the University of Delaware provide certification training for the Nutrient Management Program. They also assist the program by providing technical recommendations and by conducting research and demonstration projects on nutrient management practices. They are:

Dr. Greg Binford is an Assistant Professor of Soil and Water Quality with the University of Delaware. He is responsible for educating the public about nutrient management and the impact that nutrient management can have on water quality. He can be reached at (302) 831-2146.

Dr. David Hansen is a Nutrient Management Specialist and Extension water quality coordinator for the University of Delaware. His Extension activities include developing and conducting nutrient management training courses in support of the Delaware Nutrient Management Program. He can be reached at (302) 856-2585, Ext. 570.

Several people assist Dr. Binford and Dr. Hansen in the training programs and research and demonstration projects. They are:

Carl Davis, New Castle County Extension Office, (302) 831-2506.
Gordon Johnson, Kent County Extension Office, (302) 697-4000.
George (Bud) Malone, Extension Poultry Specialist, (302) 856-2585, Ext. 557.
Shawn Tingle, Extension Associate, (302) 856-2585, Ext. 572.
Corey Whaley, Sussex County Extension Agent, (302) 856-2585, Ext. 594.
Sydney Young, Extension Associate, (302) 856-2585, Ext. 571.
Jeanie Johnson, Senior Secretary, (302) 856-2585, Ext. 574.

How to contact the Nutrient Management Program

To reach program staff members, call (302) 698-4500 or (800) 282-8685, or send an e-mail to nutrient.management@state.de.us.

Information about the Nutrient Management Program can be found on the Internet at www.state.de.us/deptagri.

How to contact your Conservation District

The Conservation Districts provide technical agricultural professionals who can assist with nutrient management strategies and recommendations.

New Castle County – (302) 832-3100
Kent County - (302) 741-2600 Ext. 3
Sussex County – (302) 856-3990

"Water quality is everyone's responsibility"